

7-7 Operations on Functions

$$f(x) = 3x^2 + 7x$$

$$g(x) = 2x^2 - x - 1$$

$$f(-1) = 3(-1)^2 + 7(-1) = -4$$

$$g(-1) = 2$$

$$f(x) = 3x^2 + 7x$$

$$g(x) = 2x^2 - x - 1$$

SUM $(f + g)x = f(x) + g(x)$

$$(f + g)x = 3x^2 + 7x + 2x^2 - x - 1$$

$$5x^2 + 6x - 1$$

$$f(x) = 3x^2 + 7x$$

$$g(x) = 2x^2 - x - 1$$

Difference $(f - g)x = f(x) - g(x)$

$$(f - g)x = 3x^2 + 7x - (2x^2 - x - 1)$$

$$= x^2 + 8x + 1$$

$$f(x) = 3x^2 + 7x$$

$$g(x) = 2x^2 - x - 1$$

Product $(f \cdot g)x = f(x) \cdot g(x)$

$$(f \cdot g)x = (3x^2 + 7x)(2x^2 - x - 1)$$

$$6x^4 - 3x^3 - 3x^2 + 14x^3 - 7x^2 - 7x$$

$$= 6x^4 + 11x^3 - 10x^2 - 7x$$

$$f(x) = 3x^2 + 7x$$

$$g(x) = 2x^2 - x - 1$$

$$g(x) \neq 0$$

Quotient $\left(\frac{f}{g}\right)x = f(x) \div g(x)$

$$\left(\frac{f}{g}\right)x = \frac{3x^2 + 7x}{2x^2 - x - 1} = \frac{3x^2 + 7x}{(2x+1)(x-1)}$$

$$2x^2 - x - 1 \neq 0$$

$$(2x+1)(x-1) \neq 0$$

$$x \neq -\frac{1}{2}$$

$$x \neq 1$$

Composition of Functions

$$f(x) = 3x^2 - 2x + 1$$

$$g(x) = x - 4$$

$$[f \circ g](x) = f[g(x)]$$

$$[g \circ f](x) = g[f(x)]$$

Composition of Functions

$$f(x) = 3x^2 - 2x + 1$$

$$g(x) = x - 4$$

$$[f \circ g](3) =$$

"f of g of 3"

$$f(3-4)$$

$$f(-1)$$

$$3(-1)^2 - 2(-1) + 1$$

$$[f \circ g](3) = 6$$

Composition of Functions

$$f(x) = 3x^2 - 2x + 1$$

$$g(x) = x - 4$$

$$[f \circ g](7) =$$

$$f(7-4)$$

$$f(3) = 22$$

Composition of Functions

$$f(x) = 3x^2 - 2x + 1$$

$$g(x) = x - 4$$

$$[g \circ f](3) =$$

$$g(22)$$

$$= 18$$

Composition of Functions

$$f(x) = 3x^2 - 2x + 1$$

$$g(x) = x - 4$$

$$g[f(2)] =$$

Composition of Functions

$$f(x) = 3x^2 - 2x + 1$$

$$g(x) = x - 4$$

$$[f \circ g](x) = f[g(x)]$$

$$f(x-4)$$

$$= 3(x-4)^2 - 2(x-4) + 1$$

$$3(x^2 - 8x + 16) - 2(x-4) + 1$$

$$= 3x^2 - 26x + 57$$

Composition of Functions

$$f(x) = 3x^2 - 2x + 1$$

$$g(x) = x - 4$$

$$[g \circ f](x) = g[f(x)]$$

Sets

$$f = \{(2,6) (9,4) (7,7) (0, -1)\}$$

$$g = \{(\underline{7},0) (\underline{-1},7) (\underline{4},9) (\underline{8},2)\}$$

$$f \circ g = \{(7,-1) (-1,7) (4,4) (8,6)\}$$

Sets

$$f = \{(2,6) (9,4) (7,7) (0, -1)\}$$

$$g = \{(7,0) (-1,7) (4,9) (8,2)\}$$

$$g \circ f =$$

DO:

$$f = \{(8,9) (6,4) (10,9) (12,6)\}$$

$$g = \{(6,8) (4,6) (8,9) (9,12)\}$$

$$f \circ g =$$

$$g \circ f =$$

Hw

p387-388

17, 20, 23-31 odd

35, 41, 45